SECTION 3
POLICY ISSUES AND ASSUMPTIONS

3.1 INTRODUCTION

After the public comments received during Phase One of the Replacement Resources Process, it became clear at the beginning of Phase Two that certain fundamental policy issues would need to be resolved by Western to produce a useful and focused Methods Report. This section begins with a summary of the policy issues identified, followed by a discussion of the assumptions made with respect to each issue. Finally, related issues that affect the Replacement Resources Process are discussed.

3.2 REPLACEMENT RESOURCES PROCESS POLICY ISSUES

According to Western's latest contract amendment, customers will decide whether to replace "lost" GCD power themselves ("Customer Displacement Power" or CDP), or to request Western Replacement Power (WRP). Favorable market conditions currently exist on regional bulk power supply markets, due in part to existing regional capacity surpluses. Electric utility industry deregulation is beginning to allow transmission access to additional power suppliers, thereby increasing competition and decreasing prices on the bulk power supply market. Therefore, the primary concern to Western's SLCA/IP customers is the cost of replacement resources relative to other power available in the new, more competitive, wholesale power market. Cost competitiveness is an overall concern influencing other fundamental policy issues associated with the Replacement Resources Process. These policy issues are listed below and discussed in the paragraphs that follow.

- Relationship to Western's Other Strategic Goals
- Resource Evaluation Criteria
- External Costs

- Energy Efficiency
- Planning Horizon
- Frequency and Duration of Replacement
- Public Involvement

3.2.1 RELATIONSHIP TO OTHER STRATEGIC GOALS

The primary purpose of the Replacement Resources Process and the Methods Report is to comply with the Grand Canyon Protection Act. Many other goals could be developed consistent with objectives within Western, other Federal agencies, or national energy policy (for example, promoting fuel diversification, promoting renewable energy, promoting energy efficiency, reducing emissions, etc.). However, the primary goal of Western and its customers at this time is to establish methods to acquire replacement resources at a cost that is competitive in the market. Western's Principles of IRP also dictate that resources be evaluated in a fair and equitable manner.

In examining the methods for acquiring replacement power, this report will maintain a focus on the following strategic goals:

- compliance with the GCP Act;
- compliance with the CRSP Act and related legal mandates;
- adherence to Western's Principles of IRP; and
- obtaining least-cost replacement power for Western's customers.

It is possible that additional strategic goals or guidelines for replacement resource acquisition will be added in the future based on other agency or departmental policy mandates consistent with the GCP Act and CRSP legislation.

3.2.2 RESOURCE EVALUATION CRITERIA

Renewable energy, energy efficiency, or specific non-traditional generating technologies could be promoted through evaluation criteria that give added " weight" or

preference to certain initiatives such as reducing environmental effects or increasing fuel diversity. Further, the evaluation criteria could target certain technologies by providing capacity set-asides that could only be filled by these technologies, or by special credits in the quantitative evaluation. Such evaluation criteria would generally result in resource selections that are less cost-competitive for the SLCA/IP customers. However, the results might better support certain of Western's other strategic goals for resource development consistent with the GCP Act and CRSP legislation.

Consistent with the primary goal to acquire least-cost replacement power, no preference or weighting of any particular technology or fuel source will be pursued in these methods. All resources will compete on an equal basis, and the evaluation criteria and process will be consistent with Western's Principles of IRP.

3.2.3 EXTERNAL COSTS

External costs, or " externalities," are the environmental or social costs of resource production and operation that are apart from the market system and are not reflected by the market price of the resource.[1] An example of an external cost is the noxious smoke produced by a fossil-fuel electrical power plant coincident with the generation of electricity. The cost, in terms of reduced human health, air cleanliness, and other effects, is not directly considered by plant operation and is not reflected in the price of electricity.

Electric utilities, and the public utility commissions that regulate them, have a variety of ways to deal with external costs. They may be quantified and added directly to the costs of producing electricity (environmental adders), they may be considered separately, they may remain unquantified but still considered in planning, or they may be ignored. At present, there are no industry-wide standards for the consideration of external costs or even for their identification and description. Moreover, there are compelling arguments for the elimination of external cost considerations.[2] Specifically, since Federal and state

laws require electrical power plants to meet effluent emissions standards, the residual pollution output may be below the level that has been determined by legislation to be " socially desirable." Under these circumstances, especially for existing generating resources, it is arguably inappropriate to impose environmental adders or additional weighting considerations.

In light of these arguments, Western will consider environmental and social effects qualitatively in evaluating replacement resources. Furthermore, least-cost to SLCA/IP customers and their customers will be the primary consideration, subject to Western's Principles of IRP.

3.2.4 ENERGY EFFICIENCY

Western cannot directly control, verify, or account for indirect energy efficiency measures, such as those on the customer's systems. Energy efficiency measures will therefore be considered within the Replacement Resources Process through two separate methodologies. First, Western will consider direct efficiency measures; that is, reduction of loads and transmission losses under direct Western or other Federal control (e.g., Reclamation) as a potential resource. Second, indirect efficiency measures on customer systems will also be considered, but only to the extent that such measures result in measurable savings of capacity, reducing Western's capacity obligation to the customer. All energy efficiency measures will be evaluated on an equal basis with other supply resources. Western's plans in the area of energy efficiency are discussed in more detail in Section 3.3.4.

3.2.5 PLANNING HORIZON

Because of current favorable bulk power supply market conditions, regional capacity surpluses, increased transmission access to power suppliers, and increased competition, short- to mid-term purchases will likely be the lowest-cost and least-risk options currently available. On the other hand, replacement methods should be flexible enough to address changing conditions and other types of

capacity resources. While the immediate focus of the Replacement Resources Process will be on a shorter planning horizon (less than 5 years), replacement resource methodologies and evaluation techniques will allow for longer purchases, as well as other types of supply resources.

3.2.6 PUBLIC INVOLVEMENT

Public meetings and other opportunities for public input are critical overall components of the Replacement Resources Process and the identification of acceptable replacement power methods. Public consultation during the process was discussed in Section 1, and documents pertaining to this process are contained in Appendix A.

The level of public involvement in future implementation of the methods identified for screening, evaluation, selection, and negotiation for replacement resources is itself a policy issue. Public input and involvement is a key component of the Replacement Resources Process, and will be included to the maximum practical extent consistent with Western's Principles of IRP. SLCA/IP customers and others will have the opportunity to comment during appropriate points of the selection process, depending primarily upon the term of replacement. Resource evaluation and acquisition process information will be documented and available, subject to confidentiality considerations required by potential suppliers.

3.3 RELATED ISSUES

3.3.1 TRANSMISSION ISSUES

Changes in Western's power system due to modifications of GCD operations (including the addition of replacement resources), changes in the operation of existing generation, and changes to customer loads (e.g., through the implementation of energy efficiency programs) will all affect Western's transmission system. These changes could improve Western's transmission system operating capability, exacerbate current transmission constraints, or even create new transmission constraints.

The type of replacement resources considered could be designed to intentionally and directly affect Western's transmission system. Transmission modifications could be designed to improve the reliability of power being delivered or to increase the firm transfer capability of a transmission line. Without knowing the type and source of replacement power to be acquired, the need for and cost of transmission system additions or upgrades cannot be determined. In accordance with its IRP approach, Western will include effects on its transmission system as part of the evaluation of replacement resources.

There are several transmission-related issues Western will consider in its evaluation of replacement resources, as outlined below.

3.3.1.1 Transmission of Long-Term Firm-Purchase Commitments

Western will reserve transmission rights equivalent to the CROD on the CRSP transmission system to serve its long-term firm-power customers. Western will deliver long-term firm power to its customers at the same delivery points as the hydroelectric power currently delivered. Some deliveries from remote locations will be subject to available transmission capacity and possible additional cost, depending on the location of the source of the power. Transmission service needed by an SLCA/IP customer for delivery of any resource in excess of the customer's CROD may be provided by Western subject to available transmission capacity and according to the terms and conditions of the appropriate tariff.

3.3.1.2 Current Transmission Constraints

The transmission system surrounding GCD is limited in east to west and in north to south power flows. Two primary factors are responsible for this situation: (i) as Southern California experienced a population boom, many Southern Californian utilities opted to purchase lower cost coal power from the Arizona and New Mexico region instead of constructing higher-cost, local gas-fired generation; and (ii) Phoenix, a major metropolitan area of more than 2 million, is south of GCD.

Much of the region's generation is located in the coal-rich, Four Corners region, the area where Utah, Colorado, New Mexico, and Arizona meet. Although a part of this power is transmitted to the north, the majority flows either West into the Los Angeles Basin via the Las Vegas area, or South to the Phoenix area and beyond to San Diego or Los Angeles. This situation affects Western directly through power flow limitations on Western's east-west Shiprock-Glen Canyon 230 kV line, and on Western's north-south Shiprock-Western Colorado path.

Current transmission constraints will be used to evaluate replacement resources. A benefit or cost may be associated with resource location, depending on whether the replacement resource relieves or adds to the existing constraints.

3.3.1.3 SRP Exchange Agreement

The Salt River Project Agricultural Improvement and Power District (SRP) entered into an exchange agreement with Reclamation on June 26, 1962, which was subsequently amended and reformed in 1974 (SRP Exchange Agreement). The initial term of the agreement extends through May 2014. Western later assumed the contractual obligations for the agreement in 1979. The concept for the agreement arose from Reclamation's need to transmit power from GCD to its customer loads north and east of GCD in Utah, Colorado, New Mexico, and Wyoming, and SRP's desire to build additional generating capacity near sources of inexpensive coal to serve its customer loads south of GCD.

Through the SRP Exchange Agreement, SRP delivers power from its thermal generation in Colorado and New Mexico to Western for use in serving Western's customers north and east of GCD in the SLCA/IP territory. Western then delivers a like amount of power from GCD to SRP in the Phoenix area at Pinnacle Peak. Under the SRP Exchange Agreement, Western also provides transmission service to SRP for SRP's thermal generation that cannot be exchanged.

The SRP Exchange Agreement allowed both parties to reduce costs by avoiding the need to construct redundant transmission facilities. However, because changes in GCD

operations may reduce the amount of hydroelectric generation available to exchange with SRP's thermal generation, and because the transmission paths from northwest Colorado and the Four Corners area (where SRP's generation is located) to GCD are constrained, delivery of the full amount of power to SRP may not be possible at certain times along this path. SRP and Western recently signed an amendment to the SRP Exchange Agreement to better describe operation of the exchange given these changes. Information on the modeling of this important agreement as a part of this study is provided in Section 5.

3.3.1.4 NTUA EXCHANGE AGREEMENT

Western also has an exchange agreement with the Navajo Tribal Utility Authority (NTUA). Under this agreement, Western delivers approximately 22 MW of Glen Canyon generation to NTUA at the Glen Canyon substation in exchange for 22 MW of NTUA generation delivered to Western at Shiprock substation in northwest New Mexico. This agreement also includes a wheeling component, whereby Western wheels 22 MW of NTUA generation to their loads at Kayenta and Long House Valley substations.

3.3.2 HOOVER PROJECT INTEGRATION

The GCP Act states that the Secretary of Energy shall " include an investigation of the feasibility of adjusting operations at Hoover Dam to replace all or part of such

lost generation" at GCD. While a new investigation of integration was not conducted as a part of the Methods Report, prior research on integration of power from the Boulder Canyon (Hoover) Project with SLCA/IP power was collected and reviewed.

3.3.2.1 BACKGROUND

Hoover Project power is marketed by Western under the Hoover Powerplant Act of 1984, and the 1984 Conformed General Consolidated Power Marketing Criteria or Regulations for Boulder City Area Projects.[3] The Hoover Powerplant Act of 1984 provides for the marketing of Hoover power from June 1, 1987 through September 3, 2017. It provides the method for allocating Hoover capacity to be made available under renewal contracts to the original contractors, and Hoover capacity resulting from the Hoover Uprating Project (collectively called "Contingent Capacity"), along with associated firm energy, for the period. All generating units of Hoover Powerplant are operationally integrated with each other, and also with the Parker-Davis Project, to form the Desert Southwest Region.

3.3.2.2 INTEGRATION MECHANISMS

True project integration would involve creating one common load-control area, such that all projects would be operated and dispatched to serve the total combined loads of the contractors. Such operation would maximize water-generation efficiency and take advantage of the diversity in loads and operating constraints. However, for diverse systems to be successfully integrated into one load-control area and operated for maximum overall benefits, the contractual rights of existing contractors, transmission constraints or required transmission additions, and other institutional constraints must be considered. Although integration may improve overall system efficiency, reconciling the different contractual requirements could prove difficult. Providing compensation for benefits provided or lost would be complex. Quantifying the benefits and losses would likely require complex modeling, along with new coordination agreements and contractual amendments.

Project integration must also consider transmission constraints and losses, whether physical or contractual. While integration could increase the efficiency of generation dispatch, the efficiency gains could be significantly reduced or negated by transmission losses and transmission costs. True system integration must also consider whether constructing new transmission and dispatch facilities would be required. The costs of any new construction would then need to be considered in determining the overall cost-benefit and feasibility of integration.

Integration could also be at least partially implemented by establishing formal, long-term exchange agreements, which would allow projects in different control areas to more efficiently take advantage of generation and load diversity and to enhance the ability to trade or sell power between projects. Such agreements could also include purchase, exchange, or sharing of reserves, and could be implemented, subject to transmission availability, to maximize the mutually beneficial exchange of power.

3.3.2.3 Integration Issues

Prior studies indicate that integrating the Boulder Canyon Project (Hoover) and GCD may be technically feasible. However, benefits have not been quantified as the studies have generally been qualitative and primarily issue oriented. The following items have been identified in previous studies as potential integration issues:

- While integration would likely increase overall system efficiency, it is not clear whether the integration would increase firm on-peak capacity, or what the magnitude of any such benefits might be to SLCA/IP or to Western contractors in total.
- Hoover power is fully committed under current contracts extending until 2017.
- Hoover power is scheduled by its customers and their entitlements and rights are based on its actual output. Therefore, customers would have to agree to any changes in Hoover powerplant

operations that could affect these contractual rights.

- Regulation benefits could potentially be increased.
- Hoover customers schedule large amounts of spinning reserves and have rights to those reserves.
- Currently Hoover's operating restrictions place few constraints upon the scheduling of its power output, except for the fact that its energy potential is governed by water release requirements and not by power requirements. This is likely to change in the future due to the constraints being placed on Lake Mojave, and lake-level fluctuations may not be allowed for periods of up to six months. Such constraints would degrade Hoover's hydraulic capacity, thereby severely limiting its peaking capability.
- Contractual differences between the Boulder Canyon Project and SLCA/IP may be difficult to reconcile, or may place constraints upon the scheduling of the projects.
- Transmission constraints and losses could outweigh power benefits obtained due to diversity in loads and power scheduling.
- It would be very difficult to measure the benefits and losses resulting from integration, and determine to whom those benefits or losses should flow. Such issues have been a matter of dispute among Hoover contractors for many years.

3.3.2.4 SUMMARY

Western reviewed the findings of previous studies performed by Western and Reclamation on integrating Hoover and GCD. These studies indicate that while some efficiency improvements are possible from integration, institutional and physical barriers make realization of these efficiency improvements a difficult and complex task. At the present time, integrating Hoover and GCD does not appear to be a feasible method for replacing lost capacity at GCD. However, Western will continue to monitor, and participate

in when appropriate, Reclamation's future investigations of power plant integration.

3.3.3 ENVIRONMENTAL COMPLIANCE

Western will comply with the National Environmental Policy Act of 1969 (NEPA) through an appropriate level of environmental analysis on the impacts of any proposed replacement resource. Western will also ensure that replacement power acquisition is consistent with the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA, and DOE policy and regulations.[4] At the present time, Western does not intend to enter into power purchase commitments outside the range of alternatives studied in the EPM-EIS.

Western cannot establish the appropriate level of environmental documentation and public review for resource acquisitions to meet long-term firm-power commitments until after specific resource alternatives have been identified and SLCA/IP contract terms determined. In addition, the required NEPA documentation will depend on whether new generation or transmission facilities will be constructed as a consequence of the replacement resources selected.

3.3.4 ENERGY EFFICIENCY EFFORTS

As discussed above, only energy efficiency and demand management directly under Federal control (Western and possibly Reclamation) will be considered in the Replacement Resources Process. Western intends to pursue increased energy efficiency on loads and facilities within its control as a part of replacing unavailable capacity at GCD. Energy efficiency programs relevant to the Replacement Resources Process will be those programs where Western is able to decrease the energy and/or capacity requirements through increased system efficiency.

These programs may include transmission line/substation efficiency improvements, such as:

- upgrading voltage of existing lines to reduce losses;

- reconductoring existing lines to reduce system losses;
- constructing new transmission lines that reduce system losses;
- replacing power transformers with lower loss types;
- reconductoring substation bus that has marginal capacity;
- reducing station service loads/more efficient station equipment;
- increasing dispatch efficiency to increase available energy during peak periods;
- applying peak-shifting to selected substation loads (HVAC, battery chargers); and
- modifying maintenance building lighting, HVAC, insulation.

Western will also continue to examine and implement programs which decrease Western's dependence on energy. For example, improvements may be proposed to Western's office buildings and communications sites, such as:

- modifying building lighting/HVAC/insulation;
- applying peak-shifting to selected loads;
- procuring more efficient office equipment (Energy Star, etc.); and
- installing PV at remote communication sites.

Reclamation is also continuing to implement energy efficiency measures for their facilities, including dam and power plant improvements such as:

- upgrading existing generator units to increase efficiency;
- increasing generating unit availability through more efficient maintenance procedures;
- replacing power transformers with lower-loss types; and
- reducing dam station service loads through use of more efficient equipment.

Other Reclamation improvements include modifications to visitor centers and other buildings, such as:

- modifying building lighting/HVAC/insulation;
- applying peak-shifting to selected loads (HVAC); and
- procuring more efficient office equipment (Energy Star, etc.).

Reclamation also examines programs at irrigation pumping facilities within their jurisdiction, such as:

- testing and modify irrigation pumps to increase efficiency;
- modifying low voltage distribution to increase efficiency;
- applying peak-shifting to irrigation pumping loads;
- modifying pressurized irrigation to reduce energy requirements; and
- reducing irrigation water loss to reduce energy requirements.

ENDNOTES:

[1] Seneca, Joseph J. and Michael K. Taussig, " Environmental Economics," Englewood Cliffs, New Jersey, Prentice-Hall, Inc. (pg. 49)

[2] Freeman, Myrick A. et al, " Weighting Environmental Externalities; How to Do it Right" Electricity Journal, August 1992

[3] 49 FR 50582. 1984 Confirmed General Consolidated Power Marketing Criteria and Regulations for the Boulder City Area Project.

[4] 10 CFR Part 1021. Council on Environmental Quality Regulations for Implementing and Procedures Provisions of NEPA